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ABSTRACT

The inadequacy of the traditional educational program has been clearly shown in the results of Project Talent. To remedy these defects, the Project PLAN Educational system includes six principle components: (1) an extensive informational program describing the opportunities, roles, and activities for which the student might prepare; (2) ability and interest testing and interpretation of these in relation to the available opportunities; (3) a series of units and practical exercises designated to develop the student's skill in decision making; (4) a means to the information and skills gained in the three activities mentioned above to assist the student in formulating his personal goals; (5) a way of helping each student plan an educational program to enable him to achieve these goals; and (6) a system to develop the student's skill in managing the program of development which will enable him to carry out his educational plans and achieve his life goals. Experience with this program in PLAN during the past year suggests that this type of computer-supported individualized education, based on an effective set of guidance procedures, offers much promise in enabling each of our young people to achieve personal fulfillment. (Author/KJ)

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Project PLAN: The Basic Role of Guidance in Individualizing Education*

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Education in the school districts of the country is not meeting the needs of young people today. An example of this failure is contained in the story of a boy in the eastern part of the country who was included in the Project TALENT survey in 1960 when he was in the ninth grade. In reply to a follow-up form sent to him in 1964, one year after his class had graduated from high school, his mother indicated that he was now working as a carpenter's helper and that he had dropped out of school in the tenth grade. She indicated that he would like to be a carpenter, but that in his many years in school, he had not learned what she referred to as "the sound of letters" and "how to figure." Since these were requirements for becoming a carpenter, she wrote for suggestions as to where he might obtain assistance in learning these basic skills either in night school or in a special course so that he could achieve his vocational goal. A review of his answer sheets indicated that he was, in fact, quite unable to read the materials in the questions or to do the simple arithmetic exercises included. He had learned to print his name. It seems quite clear that the schools had wasted nearly all of the time he had spent with them and given him very inadequate preparation to live a satisfying and useful life.

That this is not an isolated example is clearly shown by the responses of the twelfth grade students in the Project TALENT survey. About 34% of these students stated that half the time or more frequently, "I read material over and over again without really understanding what I have read."

As another indicator of the students' appraisal of the education they were receiving, participants in the Project TALENT Survey were asked to write a five minute essay on the topic, "What High School Means to Me." In response to this, Bill, a senior in a West Coast city high school wrote; "What high school means to me - little, I feel that I have spent four

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years of rising at 6:30am to come to a building where teachers slop through a hurried lesson in the hope that they will not be subjected to extreme physical efforts. High school on the other hand is a stepping off place twixt adolescence and adulthood. It could be a worthwhile institution if the teachers were more closely screened as to their ability and proficiency in teaching her or his specific field. As it now stands it is next to useless."

Many students responded that they regarded high school as a preparation for college. Ruth, a student in a western suburban school responded as follows: "High school to me is a preparation for college which is a preparation for our later life. I did not do much preparing academically here in high school, but I have learned a lot through experience." Another small town high school attendant, Gary wrote; "Right now I don't think it means very much, but I will probably need my diploma later in life to get a job. It also depends on what high school you are attending at."

There were also a substantial number of students who indicated that high school had been of real value to them. There was a surprising tendency to stress self-discovery and occupational choice. A good example of this type of response is given by Mary who attended a private school in a small New England town: "To me high school means the most important part of my life thus far. In high school I have discovered many of my abilities and my interests. With the aid of many helpful teachers and friends, I have learned what are the really important things in life. The comradeship of people my own age has been an invaluable experience, and I will always look back on this time as one of finally attaining some maturity."

These essays indicate that the school programs were not focused on student needs in many schools. These comments were collected in 1960; however, there is little evidence to suggest that students would respond more favorably in 1970.

These data strongly suggest the need for individualizing in education. Other evidence of this need is shown by the finding that between 25% and 30% of ninth grade students have already achieved as much knowledge and ability in such fields as English and Social Studies as has been achieved by the average twelfth grade student.

The other deficiency in education as shown by the 1960 survey was the lack of realistic plans and goals on the part of the students. This is illustrated by the case of James.

In replying to the questionnaire sent out five years after he graduated from high school, Jim reported that he is married, has one child, and is currently employed as an auto mechanic. When Jim took the Project TALENT tests during his senior year in high school, he indicated he expected to make forestry his career. At the time he was tested, he made outstanding scores on the mechanical reasoning test, the creativity test, and the abstract reasoning test. He had also acquired an unusual amount of information about aeronautics and biological science. His vocabulary and reading scores were well above average, but not outstanding.

Although Jim said he wanted to make forestry his life career, he did not plan to go to college or to receive any other kind of special training. His school did not have a guidance counselor and his parents had only been as far as the eighth grade. Jim did not take advanced mathematics courses in high school and his scores on the mathematics tests were well below the average of those of twelfth graders. On the basis of his other scores, it seems likely that Jim could have developed his ability in mathematics if he had taken the necessary courses in this area for college entrance. There is also little doubt that, if given the opportunity, he could have graduated from a forestry college with a very good record. His grades in high school were mostly A's and B's. Unfortunately, at the time of graduation opportunities open to him were somewhat limited and he worked for a period in the metal trade industries before obtaining the job as an auto mechanic. He reports he is fairly well satisfied with this work and plans to make it his career. Although good mechanics are certainly needed in our society, it seems clear that our schools did not give Jim freedom to choose and prepare for a career which would have given him the most satisfaction and use his talents fully.

Other examples of the inadequacy of the guidance received by the students in 1960 are provided by the following essays prepared in response to the request to write on the topic, "My views about an ideal occupation." Michael, a senior at a suburban school in the East who had outstanding scores in mathematics, vocabulary, and both the abstract and mechanical reasoning tests and scores well above average in English and reading comprehension wrote; "It seems only natural that one would crave an ideal occupation. To be perfectly frank, I haven't much conception of what I wish to enter. Perhaps as college progresses, my solution will show itself."

Another example which indicates substantial lack of understanding of occupational opportunities is provided by Wanda from a high school in the deep South. Wanda had scores in the bottom quarter of all twelfth grade girls in mathematics and mechanical reasoning, creativity, and visualization in three dimensions. Her scores in English, vocabulary, and reading comprehension were all well above the national average. Wanda wrote: "I would like to attend a four year college and be a nurse or doctor, after which I would be prepared to work a few years. After working a few years I would like to re-enter college and take some social science courses. If I can't attend college I intend to take a job that pays hourly wages."

George is typical of a number of high school seniors who indicated they would like to pursue a career in engineering, but who fell far short of the ability requirements. George was from a high school in a small town. His vocabulary, general information, reading comprehension, creativity, and arithmetic reasoning scores were all below the tenth percentile for the national group. He wrote: "I would like to finish college with an engineer degree so that I could help the building of this World. It was also my choice because I knew there wasn't too many people in this part of the country did not go into the career, so I thought it was wise for me to do so." It seems very unlikely that George could obtain an engineering degree in college if he were admitted no matter how much he studied. He does have a few abilities which are above the national average and with proper guidance he could hope to make a contribution to "the building of this World," but it is not likely that this will happen in the field of engineering.

These findings from Project TALENT strongly indicated the need for individualizing education. To focus such a program on the fulfillment of the individual as a person, his values and potentialities must be known along with the opportunities available to him. The simplest way to plan a program of education for the individual would be to collect a large amount of data about him, feed this into a computer containing information about the past histories of persons having these characteristics, and have it print out a set of goals and a set of plans for attaining them for each student. Such a procedure would not give the individual freedom to choose. The rejection of this simple solution creates a need for a comprehensive guidance program continuing throughout the formative years of the individual

and preparing him to play the central role in formulating his goals and planning an educational program to achieve them.

The components of the program developed in Project PLAN to accomplish these findings include: (1) to learn about the opportunities, roles, and activities for which he might prepare himself; (2) to gain insight into the significance of his own pattern of values, interests, and abilities and their relation to the available opportunities; (3) to develop skill in decision making; (4) to formulate his personal goals on the basis of these skills and information; (5) to plan an educational program to prepare himself to achieve these goals; and lastly, (6) to learn to manage a program of development which will enable him to achieve his goals. Procedures for implementing each of these six components of a comprehensive guidance program will be briefly summarized.

Much importance is given at present to the rights of individuals, especially the young, to choose. Obviously this freedom to choose becomes of no consequence if the person choosing is selecting only a label. The choices of young people in recent years have been superficial and unrealistic not because they were too young to choose, but because they were too ignorant to choose. To provide the solid basis of information necessary for choosing a life pattern and a life program, it is necessary that beginning in the first grade, students be informed of the roles and activities available to them. Over a twelve year period, it is believed that students can learn a great deal about the satisfactions to be gained from various types of activities, the requirements for participating in these activities and the implications for other aspects of the life pattern which result from a specific choice.

Such a program represents a radical departure from much current practice in guidance. Because of the small amount of time allotted to guidance activities, it has been the usual practice to make occupational information available to students and allow them to explore the vocations in which they think they might have a special interest. The choice of an occupation is too important to be left to such casual procedures. Increasingly, a much wider range of occupational opportunities are being opened to young people from all socio-economic levels. Technological changes are producing many new jobs and eliminating large numbers of the vocational opportunities presented to previous generations. Education is more and more proving an effective equalizer for young people who have lacked some of the social

and economic advantages of their peers. Although sex is still a very large factor in occupational choice, more opportunities are being made available to women who wish to enter the more typically masculine occupations.

It is clearly not important that each child learn about all of the details of the several thousand specific occupations in which adults are now engaged. It does appear that they should be generally familiar with the hundred or more occupations in which as many as one in a thousand adults are actively engaged. References such as the Occupational Outlook Handbook are of great value as a basic source of general descriptive information about these vocations. Writers and publishers have used these materials as a source for providing more interesting descriptions of these occupations.

In the PLAN program, beginning in the first grade, instructional units are integrated into the social studies program describing various types of jobs, the specific contribution made by persons in each of these fields of vocational effort, and especially in the later grades, the educational and ability requirements for successful performance in these occupations. In other courses, such as language arts, science, and mathematics, a student is provided with information about the occupational opportunities related to these fields such as writing, scientific research, and the application of mathematics to computer technology.

To simplify the presentations and give the student a more coherent picture of occupational opportunities, the data from Project TALENT have been used to group occupations into twelve job families. The occupations in each of these sets were originally grouped on the basis of similar educational requirements and types of activities. The ability profile for each occupation was then compared with both those of the other occupations in the group to which it was tentatively assigned and also those in the other eleven groups. On the basis of these comparisons, a few changes were made to provide greater homogeneity in each of the groups. The noncognitive variables such as self-description of personal characteristics, interests, and biographical data were then studied for each of the occupational groups and it was noted that the twelve groups were also quite homogenous with respect to their profiles in these variables. These twelve long-range occupational goal groups have provided the basis for a systematic presentation of information about all types of occupations to PLAN students.

These data must be regarded as tentative since they are based on the reports of the career plans of students who are five years out of high school - about 23 years old. The statistics being used in PLAN are based on purified groups from which persons who had made little progress toward their career goals were removed. Most of the young people are either engaged in the occupation or in an entry level job or in the later stages of professional training for this occupation. Certainly a follow-up ten or twelve years after the graduation of this group from high school, when they are about 30 years old, will provide more definitive information regarding the abilities and interests represented by the members of the various career groups. However, the present data seem to provide, for the first time, a sound basis for assisting young people to evaluate their abilities in relation to those who enter various careers.

The twelve long-range occupational goals, together with the occupations which include the largest numbers of young people in each, are shown in Figure 1. In general, persons wishing to enter occupations in any of the first six long-range goals will need to graduate from a four-year college. For the remaining six, trade and technical training or apprenticeships are generally required.

This Spring in PLAN classes at the secondary school level, students are studying the ability requirements of each of the twelve long-range occupational goals. These are presented as shown in the two examples in Figure 2. The two occupations for which profiles are shown are carpenter and electrical engineer. The profile indicates the mean score and the scores 1 standard deviation above and below this mean. The electrical engineers are highest in mathematics and mechanical reasoning tests. The carpenters are above the average for all twelfth graders only in the visualization in three dimensions test. The electrical engineering group tends to be quite high on all the measures of academic achievement and ability. The carpenter group is highest on the non-academic measures such as visualization in three dimensions, mechanical reasoning and abstract reasoning, and tend to be quite low in the academic achievement and ability areas. This information about the scores made by students in high school who later were entering careers in various areas should be very valuable to students in gaining a better appreciation of the requirements for various types of occupations.

It is, of course, not enough for the student to know the ability requirements for various types of careers. It is essential that he have as accurate information as possible with respect to each important type of ability. In the PLAN program, the terms intelligence and aptitude are not used. It is believed that these have come to be identified by students and teachers as describing fixed limits for abilities. The concept used in PLAN is the student's developed ability to perform with respect to various types of activities. It is important that the student understand that the score on any test provides only a rough estimate of his present status and that his performance with respect to any ability may be improved by special effort on his part. In addition to information about individual differences, the student needs information about the nature of learning and the amount of effort which will be necessary to produce a specified amount of improvement in his level of performance on any given ability.

One procedure for giving the student an impression of his own developed ability to perform in relation to those of persons entering careers in various fields is by estimating from the student's score on a test given in the ninth, tenth, or eleventh grade, his expected twelfth grade score and its probable error of estimate. Thus, for each present score the student can be given a band indicating the level at which his score is likely to fall in the twelfth grade and this may be compared with profiles such as those in Figure 2. This information should be very valuable to the student in formulating his occupational goals and planning his program of studies to achieve these goals. The intent of the program is not to narrow down his range of possible choices, but to broaden the range with some indication of the effort required to attain the developed ability level necessary for entry into a particular career.

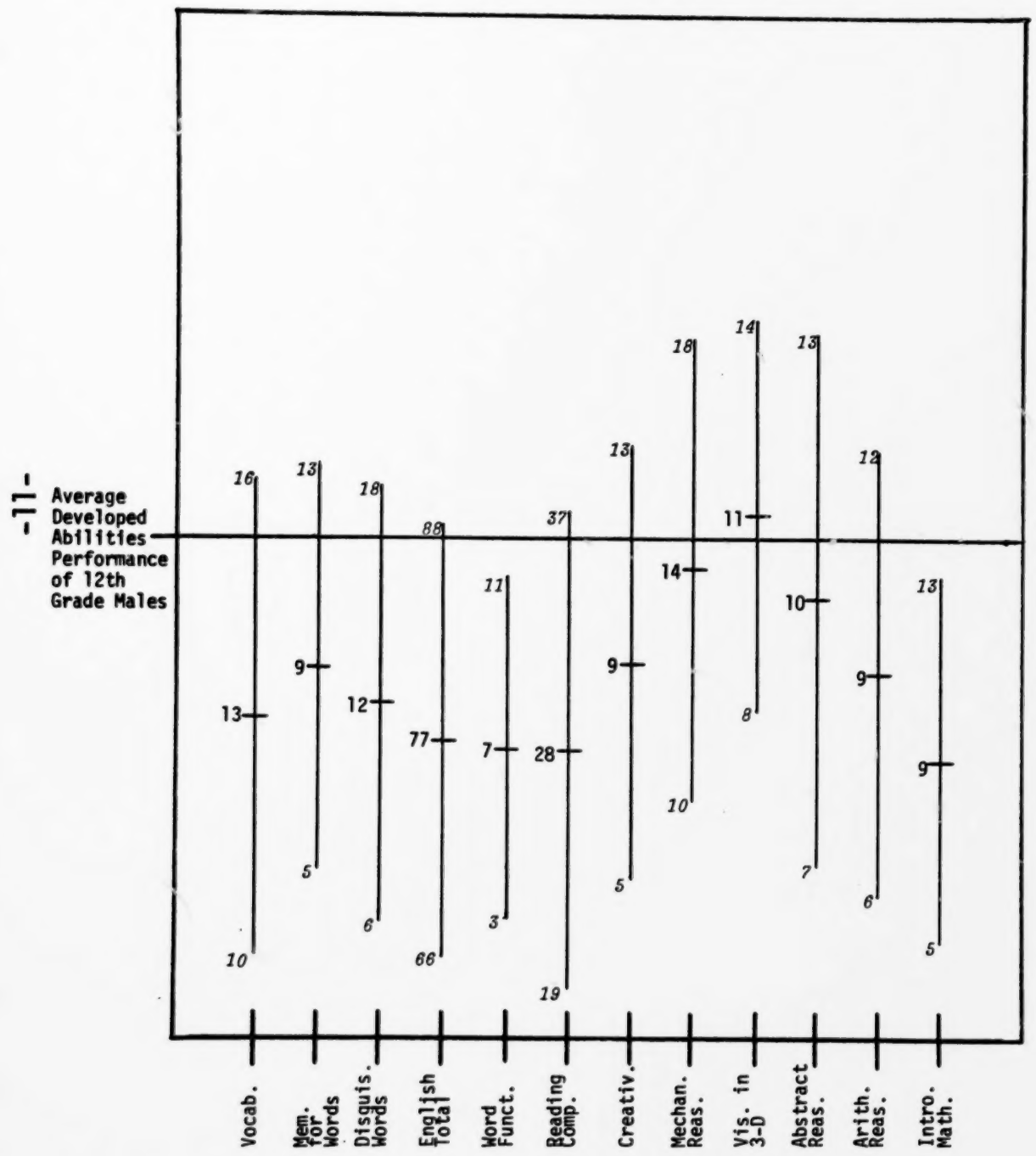
To provide the student a convenient way of estimating his interest in each of the twelve long-range occupational goal areas, a set of a hundred and twenty items including ten statements describing activities associated with each of the twelve long-range occupational goal areas, has been developed. These have been selected as activities in which the student could be expected to have had some experience. By indicating his level of interest in each activity, it is possible to obtain summary scores that will provide a better insight into the extent of his liking for activities such as those found in a particular group of careers.

FIGURE 2

EXAMPLES OF TEST SCORE PROFILES

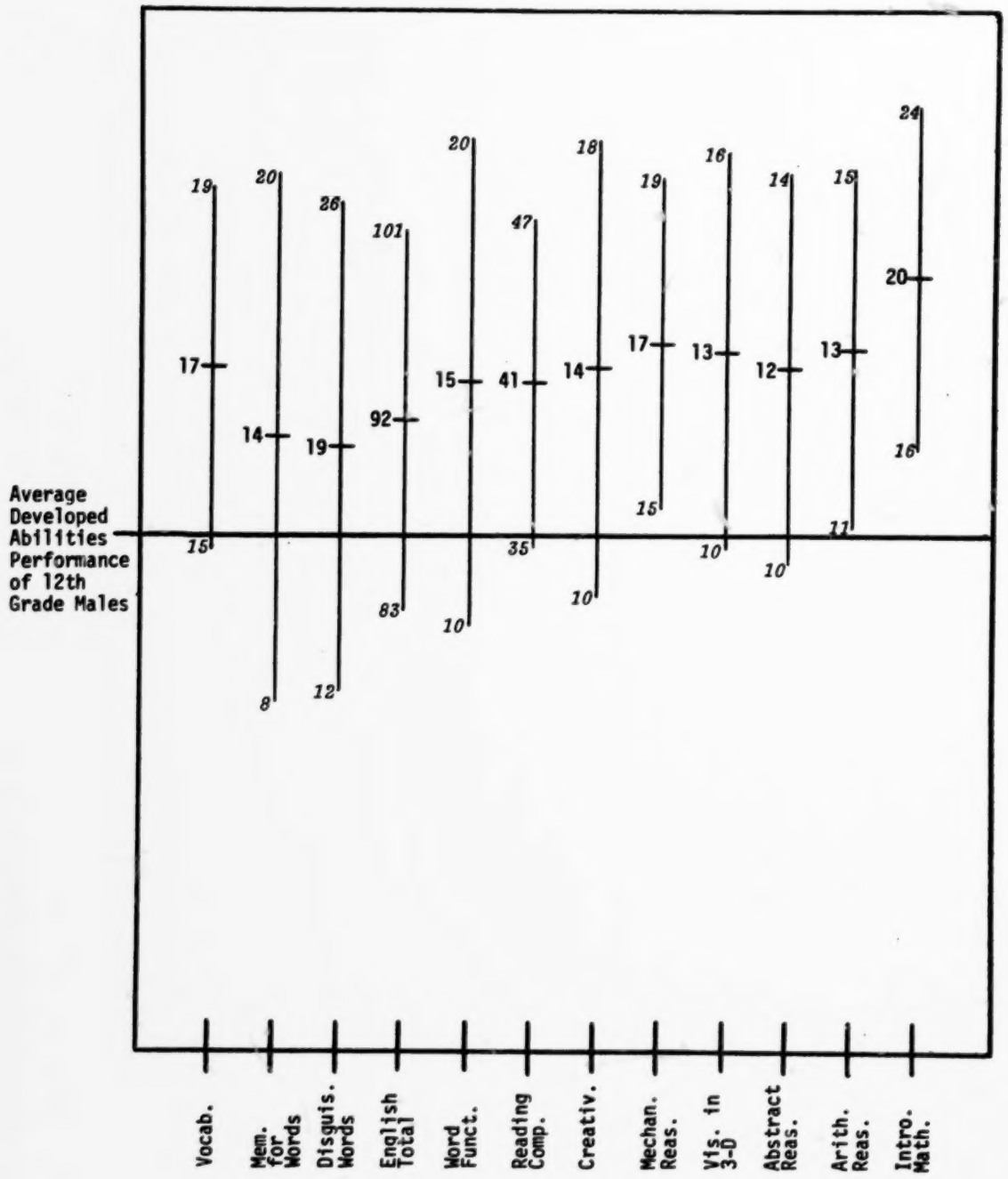
10. CONSTRUCTION TRADES

12th Grade Profile of 12 Measures of Developed Abilities for Male Students Who Were Later Identified as CARPENTERS



1. ENGINEERING, PHYSICAL SCIENCE, MATHEMATICS, ARCHITECTURE

12th Grade Profile of 12 Measures of Developed Abilities for Male Students Who Were Later Identified as ELECTRICAL ENGINEERS



To formulate his life goals, the student needs not only information regarding the available opportunities, roles, and activities, and a clear understanding of his own abilities, interests, and values in relation to these activities, but also skill in decision making. To develop this skill, the student is first introduced to the steps involved in a systematic approach to decision making. This is done principally by providing descriptions of decision making by high school students such as those in Project TALENT.

For example, the student is introduced to George Smith. Something of his family, his activities, his home life, and his school activities is provided. This is followed by a presentation of the results of a self-analysis and self-description by George which has resulted in the formulation of the values and other considerations which will be involved in his decision making. These values and other considerations will be systematically analyzed to provide specific and detailed descriptions of career outcomes which are important to his choice. On the basis of this information about his goals and his abilities and other characteristics, a few appropriate careers would be presented. The advantages and disadvantages of each of these would be systematically explored and tabulated and compared with the analysis of the desired outcomes. On the basis of this comparison, one of the careers would be selected. This selection process would also include discussions of the consequences of selecting each of the other alternatives.

By reading and studying several such examples, it is expected that the student would become familiar with the decision making process. To develop skill in this process further examples would be given in which the student would be asked to carry out particular steps himself. His performance in these learning activities would be guided so that he would become more independent in carrying out the decision making process. His skill in decision making would be measured by a series of exercises given at the end of the training period in which the correctness of the procedures and decisions for the specified cases would be scored. As with other learning activities in PLAN, if the student had not reached the mastery level for this skill he would be given additional instructional material and tested again.

When the student has all three of the necessary components to formulating goals for himself, he is encouraged to develop a tentative set of goals.

For example, in the career field, he would be expected to have a complete overview of the nature and functions of occupational roles including detailed information regarding the twelve long-range occupational goal groups along with the educational and ability requirements for each of the main occupations in this field. He would also be expected to have a good understanding of his abilities, interests, and values in relation to these. Using this information, he would apply his skill in decision making to explore the consequences of various alternatives and finally would make a tentative selection of a long-range occupational goal. In doing so in PLAN much emphasis is given to the fact that this is a tentative decision and that one of the important considerations in making such a decision is to make it possible to change to any one of a number of other attractive roles if subsequent experience indicates that this is desirable.

It is to be expected that the definition of values and the formulation of goals will interact with each other since values tend to be somewhat abstract and goals to be more concrete. It is very important for students to have goals even though they are tentative and broad since they provide the basis for planning the educational program.

The next step in the guidance program for PLAN students is to assist the student to prepare a program of studies which will enable him to achieve his goals. In PLAN the program of studies is based primarily on the learning needs of the student. A few of these such as state and local requirements, examination requirements, or, for some, college entrance requirements, are established by external agencies. To the extent possible, however, each student's program of studies is developed to represent the specific learning required to achieve his goals.

Once the goals to be achieved by the end of the twelfth grade are tentatively established, the program of studies can be developed from information from several sources. These include: (1) the record of what he has already studied and learned with respect to all of his various needs; (2) the identification of the two-week learning modules which will be required to achieve his goals; (3) other highly desirable or probable interest modules to be included in his program if time allows; (4) a quota of modules in each subject matter area for the academic year based on his learning during the previous year and his present level of development with respect to his general academic

abilities; (5) in addition to the long-range goal, tentatively selected by the student and parent, a data-suggested long-range goal is chosen on the basis of the relevant data on file in the computer.

The pupil/parent goal is given first priority, but wherever possible the student's program is broadened to prepare him for the data-suggested goal as well. Thus, a particular student's parents might plan that he discontinue his education after high school and enter the family business or start an apprenticeship in a trade. However, if the data-suggested long-range goal involved college training, an effort would be made to include the requirements for college entrance insofar as possible. The Project TALENT data also indicate that when five years out of high school many more of the boys plan to enter careers in business, teaching, the construction trades, and the behavioral sciences than planned to do so when they were in high school. If these changes can be anticipated, the student can be prepared for them.

The last phase of the guidance program in PLAN involves the personal and social development of the student and his skill in managing his own developmental program. These aspects of the program are still in the experimental stage, but it is believed that they represent an essential component in an effective educational program. It is not enough that the student take responsibility for and plan an educational program. He must also have the skills and personal qualities which will enable him to carry out this program. The experimental program now being tried out in a number of schools is based on the systematic observation of behavior and the application of modern methods of behavior change for types of behavior needing improvement. The most notable feature of these programs is that, here again, the responsibility for the student's development in these areas is given to him in the same individualized learning format as the other aspects of the PLAN program. It is hoped that it will be possible to report substantial progress in this area soon.

Summary and Conclusions

The inadequacy of the traditional educational program has been clearly shown in the results from Project TALENT. Many individuals under the present system are given little opportunity to learn in today's classrooms. Project

TALENT also demonstrated that the achievement levels reached by many of the students are quite unsatisfactory. With respect to the guidance programs, the survey showed that a large portion of the students have not been given the necessary information and skills to enable them to plan their educational programs and prepare for appropriate careers.

To remedy these defects, the Project PLAN educational system includes six principal components: first, an extensive informational program describing the opportunities, roles, and activities for which the student might prepare. This includes both a large number of instructional units integrated into the principal subject matter fields from the first through the twelfth grades, and also a set of review and summary units to insure comprehensive coverage before decision points at the secondary level. The second component includes ability and interest testing and interpretation of these in relation to the available opportunities. The third component consists of a series of units and practical exercises designed to develop the student's skill in decision making. The present PLAN program uses Project TALENT findings and cases as the basis for this practice. The fourth component utilizes the information and skills gained in the three activities mentioned above to assist the student to formulate his personal goals. The fifth component, which follows directly from the preceding one, is directed toward helping each student plan an educational program to enable him to achieve these goals. The sixth and last component is designed to develop the student's skill in managing the program of development which will enable him to carry out his educational plans and achieve his life goals.

The experience with this program in PLAN during the past year suggests that this type of computer-supported individualized education, based on an effective set of guidance procedures, offers much promise in enabling each of our young people to achieve personal fulfillment.